Classification of constrained differential equations embedded in the theory of slow fast systems

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Propositions

belonging to the thesis

Classification of constrained differential equations embedded in the theory of slow fast systems

of

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1. The classification of generic smooth functions plays an important role in the theory of constrained differential equations (CDEs).

2. There is a topological classification of generic CDEs related to the A_k, D^4, and D^{-4} catastrophes. (Chapter 2)

3. The classification of "stelling" 2 can be embedded into the theory of slow fast systems providing robust SFS-models. (Chapter 3)

4. An A_k slow fast system is formally conjugate to its principal part. (Chapter 3)

5. There exists a unified way to study the dynamics of all A_k slow fast systems. (Chapters 3 and 4)

6. Modeling real life phenomena such as the heartbeat, the electrical activity of neuron cells, chemical reactions, turbulent flows, or the weather forecast, often involves multi-scale data, therefore they may be modeled by slow fast systems.

7. Doing a PhD is like a slow fast system: there are rapid transitions between "apparently long" stable states. Fortunately, not all of these rapid transitions are catastrophic.

8. By erring, erring one gets closer to hit the target. (translation of: *Errando, errando, se va acertando.*)